



## **NE DISTRIBUTION LINE CLEARANCE SPECIFICATIONS**

**Updated 12/18/07**

### **I. Scope/Intent**

- 1.1 These specifications cover the cutting, clearing, pruning, tree removal and herbicide treatment of vegetation along overhead electric distribution lines and the corresponding substations. The intent is to define the minimum clearances to be obtained between the overhead conductors and vegetation that will be acceptable to National Grid. These specifications are strictly for use on overhead line maintenance pruning projects. This is not a specification to be used for enhanced hazard tree removal, new construction clearing or rebuild construction clearing.

### **II. Program Objectives:**

- 2.1 The goals and objectives of the NGRID Distribution Line Clearance program are to provide safe, reliable, electric service through a cost effective, integrated vegetation management program. NGRID acknowledges differences in the manner in which various landowners respond to the need for routine line clearance activities, together with occasional differences in easement rights. Therefore, these specifications are designed to address:
  - the minimum clearance requirements necessary to sustain safe, reliable electric service while striving to satisfy the concerns of sensitive customers,
  - and the optimum clearance requirements necessary to sustain an appropriate level of safety and reliability.

### **III. Definitions:**

**Maintained Area:** Generally defined as an area where the landowner or occupant is mowing the lawn and/or caring for gardens, ornamental shrubs or trees in the area under and immediately adjacent to the distribution poles. It includes commercial land uses such as business areas, parking lot edges and the tree lawn areas along urban and suburban streets. Un-maintained areas, of course, hold the opposite of these characteristics. It should be noted that within residential (maintained) areas there may be small sections of un-maintained property between yards or along the roadside of residential front lawns, etc. These small sections shall be treated as maintained areas for the purposes of this specification.

**Mature Tree Line:** A generally straight and contiguous line of trees nine (9) inches d.b.h. or greater, that mark the boundary between the forested edge and the maintenance corridor. In the case of an existing mature tree line, there may be individual mature trees that are rooted closer to the pole centerline than the common mature tree line. In these instances the mature tree line continues behind those individual trees.

**Maintenance Corridor:** The area physically located under and alongside the overhead distribution feeder bounded by the mature tree line when one exists. In the absence of a mature tree line the maintenance corridor is defined as the area that is at least ten (10) feet either side of the pole centerline or equal to the previously maintained dimensions if greater than ten (10) feet.

**Service Drop or Service Line:** The last span of triplex or open three wire extending to the building or meter pole or a multi-span run of either triplex or open three wire that serves a single customer. This does not include street light services.

**Secondary:** The conductor, either triplex or open wire, which extends from the transformer to the Service Drop. Secondary spans may run along under primary spans or separately.

**Street Light Secondary:** The conductor, either triplex or open wire, which leaves the primary pole to pole configuration and extends out to service a street light or lights.

#### IV. Scope of Work:

- 4.1 **Pruning Standards:** All pruning shall be performed in accordance with ANSI A300 standards as well as the Best Management Practices – Tree Pruning publication. All cuts shall be made at a parent branch or limb, so that no stub shall remain. In cutting back a branch, the cut shall be made at a crotch or node where the branch being removed is at least one-third the diameter of the parent limb. All pruning cuts shall be made in accordance with proper collar cutting methods, utilizing drop crotch principles to minimize the number of pruning cuts, promote natural growth patterns, and maintain tree health and vigor (ANSI A300). Climbing irons or spurs shall not be used in pruning a shade/ornamental tree to be saved. Tree wound dressings shall not be applied.
- 4.2 **Line Clearance within Maintained Areas:** All overhead primary lines shall be pruned to provide a minimum of ten (10) feet of overhead clearance, a minimum of six (6) feet of side clearance from the outermost phase and a minimum of ten (10) feet of clearance below the wires. The contractor shall recognize that the use of ANSI A300 standards and techniques will result in clearances beyond the dimensions noted above.
  - 4.2.1 The main trunk of the tree or major leads which are structurally sound and healthy may be left growing within these distances as long as none of the smaller diameter end branches are within the clearance dimensions. In that case the lead must be removed.
  - 4.2.2 Where greater clearances have been achieved in previous cycles, the pruning shall be completed so as to re-establish the clearances in a manner that equals or exceeds the previous clearance conditions.
  - 4.2.3 The contractor shall ground cut any new volunteer growth capable of growing into the wires from around poles, guys, fences, etc. within the maintained yard areas after notifying the property owner.

- 4.2.4 It is an objective of National Grid's program to continually strive to reduce the number of under-wire tree and branch growth that will continually require pruning, by removing as many stems and growth as possible on each cycle. The Contractor is expected to emphasize this type of removal through the landowner contacts made by their customer contact personnel.
  - 4.2.5 All slash from pruning in maintained areas shall be disposed of through chipping. Large diameter wood may remain on site provided it is cut into manageable lengths and piled neatly. Smaller debris shall be raked up and removed so as to leave the property in a condition equal to the start of work.
- 4.3 Line Clearance Outside of Maintained Areas: All overhead lines shall be pruned to provide a minimum of fifteen (15) feet of overhead clearance and six (6) feet of side clearance from the outermost phase. Where greater clearances have been achieved in previous cycles, the pruning shall be completed so as to re-establish the clearances in a manner that equals or exceeds the previous clearance conditions.
- 4.3.1 The contractor shall ground cut all trees and shrubs which have the ability to interfere with the conductor out to the limits of the existing maintenance corridor. Where a maintenance corridor does not already exist, ground cutting shall be performed for a minimum distance of ten (10) feet either side of centerline. Ground cutting shall include stems of eight (8) inches d.b.h. or less, all as part of the fixed price bid. Along individual spans that have been previously maintained using National Grid's past eight (8) foot targeted ground cutting specification (trimming and removal) the same approach shall be utilized.
  - 4.3.2 Along off-road sections the contractor shall completely remove all side branches that extend into the maintenance corridor from below and beside the lines in order to "box out" the maintenance corridor. This practice will minimize future pruning efforts as well as improve storm restoration and line inspection efficiencies.
  - 4.3.3 Where trees beyond the limits of the maintenance corridor are extending into the corridor, the contractor shall either prune those limbs back or have the option to remove the tree as part of the fixed price bid. For trees, eight (8) inches d.b.h. or less, where the top of the tree is leaning out into the corridor so that topping would be the only possible correction, the contractor shall ground cut that tree as part of the fixed price bid.
  - 4.3.4 Stumps shall be cut flat and as close to grade as possible.
  - 4.3.5 All slash along the roadway or near residences shall be disposed of by chipping or mowing/mulching. Where practical, chips may be blown back onto the site without creating large chip piles. On off-road, un-maintained sites, slash shall be mowed/mulched or neatly windrowed to the edge of the maintenance corridor and cut to lie close to the ground, away from sensitive locations. No debris shall be left anywhere that will potentially block access, significantly alter any drainage or water resource, or create any unsafe conditions for the public. Alternatives to these

practices must be approved by National Grid's Forestry representative and by the current landowner.

- 4.4 All dead or damaged overhead limbs, branches or leads that are capable of falling onto overhead primary wires from above or along side the right-of-way and potentially causing a tree outage, shall be removed at the time of pruning, and included in the fixed price bid.
- 4.5 For all pine species growing above the overhead clearance limits with boughs overhanging primary conductor - the contractor shall shorten all overhanging boughs so to reduce the length of the branch by approximately 1/3 without removing all needle growth from the entire branch. This shall be done in a progressive manner beginning at the upper clearance dimension (10 or 15 feet) and working upwards generally two (2) whorls in the tree as necessary to reduce the likelihood of a long pine bough loaded with ice or wet snow, drooping down or breaking onto the conductors.
- 4.6 Pruning Clearance for Secondary and Service Lines:
  - 4.6.1 All secondary wire (triplex and open wire), other than that serving street lights only, shall be pruned to provide a minimum of eighteen inches of clearance from wire to vegetation.
  - 4.6.2 All service wires (triplex or open wire) and street light secondary on the circuit shall be inspected during the pruning process. For branches that are either making hard contact with the service wire, pushing on or creating tension enough to force the wire out of a natural arc, or redirecting the wire out of a straight line run, the vendor shall do whatever pruning is necessary to correct that situation. The entire service drop need not be pruned, only the point of conflict.
  - 4.6.3 For open wire services, pruning is required for all the situations noted in 4.6.2 as well as anytime vegetative growth is forcing the three wires out of their normal configuration. The vendor must take extra care when pruning around open wire services so not to cause a service interruption to our customers.
- 4.7 Multiple Circuits and Under-builds: The contractor shall prune all distribution circuits on a pole unless otherwise called out on the bid documents. Where a distribution circuit is under-built below either a sub-transmission or transmission line the contractor is not responsible for the pruning of that portion of the circuit unless otherwise directed in the bid documents. However, the contractor is responsible for work on any primary, secondary or service tap running off the sub-transmission or transmission pole line as long as the bid circuit is under-built. Any exceptions to the above will be explained at the time of bidding.
- 4.8 Circuits along Transmission Rights-of-Way: The contractor shall employ this specification on all sections of distribution circuits that run along segments of transmission rights-of-way except for areas where the distribution circuit is

actually under-built on the same pole. In those cases the above section will apply. Any exceptions to the above will be explained at the time of bidding.

- 4.9 Substation Clearances: All vegetation within 10' of the substation fence shall be pruned, from ground to sky, removed and chipped and no overhanging branches shall be allowed to remain. Where shrubs and trees have been planted for screening purposes and are rooted within the 10' distance, only the fence side branches shall be removed. Any volunteer growth (natural regeneration) rooted within the 10' distance shall be removed.
- 4.10 Vine Control: All vines growing on poles, guy wires, stub poles or towers shall be cut so as to create a "growth gap" of 2 feet and treated (where appropriate) with a herbicide approved by the company.. Contactors should not attempt to remove vines from any structure.
- 4.11 Hazard Tree Inspection and Removal: Other than work required in previous sections, the removal of any tree over 8 inches d.b.h. within the maintenance corridor or outside the maintenance corridor shall be considered a hazard tree removal and is outside the fixed price bid.
  - 4.11.1 While pruning the circuit, the contractor's personnel shall perform a visual inspection of each tree along the circuit in order to identify potential defects and determine the potential risk for the tree to cause an interruption over the length of the pruning cycle. The crew shall work closely with National Grid Forestry representative to determine potential hazard trees, preparing a list of trees in accordance with National Grid's Hazard Tree Reporting Form. The completed lists of potential hazard trees shall be regularly provided to the Forestry representative for review and approval prior to removing any of those specific trees. Exceptions to this procedure may be approved to enable removals of trees that have been pre-identified as hazard trees by National Grid representatives, trees that pose an imminent risk, or to authorize hazard tree removals in off-road areas where a skidder bucket is already on site.
  - 4.11.2 Once a crew completes the removals on an approved list they shall note the completion details on the Hazard Tree Reporting Form. This form shall be submitted to the Forestry representative on a timely basis. Once the list is audited the contractor may submit an invoice for that specific work.

V. Contractor Requirements

- 5.1 The Contractor shall do all work and furnish all labor including supervision, tools, machinery and transportation necessary for the pruning, removal and herbicide treatment of trees to provide acceptable vegetation clearance for overhead lines of National Grid. Work at the fixed price rates will be designated on the distribution circuit maps, and identified in the pre-bid documents. Work at the fixed price is

based on overhead primary miles of line, and includes pruning, tree and lead removal and herbicide treatment to all primary, secondary, service drops, and substation fence areas as clarified in the Work Scope section of this specification. Work at unit prices and/or hourly rates as also defined in the Work Scope section will be designated at the pre-bid meeting or by a National Grid Forestry representative as required.

VI. Contractor's Responsibility

- 6.1 The Contractor shall provide all necessary supervision, labor, material, tools and equipment for the safe execution of all work covered by these specifications.
- 6.2 The Contractor shall employ a competent field supervisor and customer contact person(s) acceptable to the Corporation, in addition to the crew Foreman and senior Company management. The supervisor shall be available to the Corporation at all reasonable times during the entire extent of the project and/or contract. In addition, at least one member of each stand-alone crew or unit of crews shall be fluent in the English language.
- 6.3 The Contractor shall comply with all building and sanitary laws and all Federal, State, County, Town and Municipal laws, ordinances and regulations pertaining to the work. The contractor shall be responsible for obtaining all permits necessary to perform the work unless otherwise provided by National Grid
- 6.4 The Contractor shall notify each landowner and inform them of the clearing, removal, pruning and herbicide work to be done, and where appropriate, agree on access point(s), before crossing the property and then abide by the same. The Contractor shall designate a Customer Contact Person(s) for each project they are awarded and communicate that name and phone contact information for that person to the National Grid forestry representative for that project.
- 6.5 In the event that the Contractor cannot locate the landowner after using all reasonable measures, or upon locating them is aware of an objection to the work to be performed, the Contractor shall document the landowners concern and then notify the National Grid's forestry representative in a timely fashion in order to obtain specific instructions and/or their permission prior to commencing work on that property.
- 6.6 In addition to the above notifications, where herbicide applications will be made, the Contractor must follow any and all current notification requirements of any applicable regulations.
- 6.7 The Contractor shall be held solely liable and indemnify National Grid fully for any and all claims and legal expenses for damage to crops, land, trees or otherwise resulting from such violations, failure or damages arising out of the Contractor's negligence. The Contractor shall not be liable for claims or suits for

damage to property if the work causing such damage is done under specific direction from NGRID.

- 6.8 The Contractor shall replace or make necessary repairs to all property destroyed or damaged in the course of the work and exercise due care and diligence in adequately protecting all properties, both real and personal, from damage of whatsoever nature whenever crossed over, on, or in the vicinity of the work. If the contractor neglects or fails to promptly make said repairs or make good of said destruction, the Corporation may make any and all necessary repairs to the satisfaction of the property owner and the Contractor agrees to promptly reimburse the Corporation the amount of its incurred cost and expenses.
- 6.9 The contractor shall inform the National Grid Forestry representative of their intent to start work at least two weeks prior to the start of any action on a feeder.
- 6.10 The Contractor shall implement and provide the required training and certification programs necessary to provide fully qualified Line Clearance Tree Trimmers or Line Clearance Tree Trimmer Trainees. A single Foreman may supervise multiple bucket trucks on the same project. In that case however, the minimum qualifications for the "lead" person on each of the other trucks shall be a certified qualified Line Clearance Tree Trimmer. At least one other employee on the truck shall be at least a qualifying Line Clearance Tree Trimmer Trainee, in accordance with all applicable OSHA requirements.
- 6.11 The Contractor shall submit a weekly time report to the National Grid Forestry representative, indicating the labor and equipment assigned to the project, amount of work accomplished, quantities and location of herbicide applications and location of the work.
- 6.14 The Contractor shall provide a monthly summary report to Distribution Forestry, identifying crew staffing and equipment by area as of the first of each month, to be submitted by the 5<sup>th</sup> of each month or the following Monday should the 5<sup>th</sup> fall on the weekend. The report shall also identify work type (e.g., such as hourly, new construction, danger trees, mowing; lump sum or unit price) by project, percentage complete for all fixed price projects, and anticipated completion dates.
- 6.15 The Contractor shall provide a monthly OSHA injury summary report in a format supplied by National Grid for the previous month, no later than the 10<sup>th</sup> of the month or the following Monday should the 10<sup>th</sup> fall on the weekend. The data in the report shall be separated by state as well as reported for the overall Contractor Company for any and all United States operations.
- 6.16 By April 10<sup>th</sup> of each year, the contractor shall provide a list of employees that could reasonably be expected to work on National Grid's property to Distribution Forestry. This listing shall include:

- identify the current pay classification of each employee, together with their union certification level,
- the date of their progression to their current pay level,
- the dates each employee completed their required OSHA safety and other training, or retraining, including any annual refreshers,
- the date each employee last demonstrated their tree rescue and climbing proficiency
- the date each employee completed first aid and CPR training,
- identify each certified pesticide applicator and their certification number.

6.17 The contractor shall provide a unit cost per tree for the removal of potential hazard trees from the three phase portions of the circuit, as well as "high risk target" hazard trees from the single-phase portions. See the attached Addendum # 1, Hazard Tree Tree Removal, Unit Price Schedule to be bid separately from the fixed price project. National Grid reserves the right to award, in whole or in part, the removal of hazard trees for each bid package on the basis of these unit price costs, or to do the work at the contractor's current hourly rates.

VII. Acceptance of Work

- 7.1 At appropriate intervals, the Contractor shall report and review the work completed to date with National Grid's Forestry representative. The Contractor may then invoice for the percentage of the work completed and approved by National Grid.
- 7.2 Near completion of the work, the Contractor shall notify the National Grid Forestry representative that the entire project has been reviewed by the contractor's supervision and is now ready for inspection. Upon review and acceptance of all required work including the resolution of any and all required corrective actions as well as any outstanding damage claims, the NGRID Forestry representative will give the Contractor permission to submit a final invoice for payment.
- 7.3 The contractor shall understand, per their signed Master Purchase order with NGRID that time is of the essence with respect to the performance of this work. The contractor shall take all appropriate actions necessary to complete the work on schedule. Those actions shall include among other things, the use of overtime, the use of supplemental labor crew resources from outside areas, and the use of subcontractors, notwithstanding the NGRID requirement for advanced approval of all subcontractors. All actions employed by the contractor to meet schedules are at their cost and shall not affect the lump sum contract amount. In the event of extenuating circumstances defined by NGRID, the company reserves the right to extend project completion dates.



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Addendum #1  
**Hazard Tree Removal**

Unit Price Category Definitions:

Removal-Maintained Area: Normally within city town or village settings in areas where lawn and ornamental tree and shrub care is evident. The contractor will safely fell the tree, limb and chip all brush and flush the stump as low as is practical. The wood will be cut to manageable lengths and yard cleanup performed.

Removal-Roadside Area: Normally, outside of any maintained areas as described above. The contractor will safely fell the tree, limb and chip all brush, flush the stump as low as is practical, and leave the wood to lie where it is felled. Minimal cutting should be required other than to allow the wood to lie flat against the ground.

Removal-Unmaintained Area: Outside of any maintained area along a wooded roadside or off-road section of line. The contractor will safely fell the tree and make the necessary cuts on the tree to have the wood and brush lie relatively flat against the ground (drop and lop).

### **Unit Price Schedule**

<u>Diameter Class</u>	<b>Removal-Maintained</b>	<b>Removal-Roadside</b>	<b>Removal-Unmaintained</b>
8 inches or less	<u>Lump Sum</u>	<u>Lump Sum</u>	<u>Lump Sum</u>
>9 – 12 inches	_____	_____	_____
>13 – 18 inches	_____	_____	_____
>19 – 24 inches	_____	_____	_____
>25 and up inches	<u>T&amp;M</u>	<u>T&amp;M</u>	<u>T&amp;M</u>

Note: For hazard trees that have been removed and the D.B.H. cannot be determined, NGRID will deduct 2 inches from the average stump diameter to determine payable size.

Complete removal of wood will be performed on a T&M basis.

Removals above 24 inches D.B.H. shall be performed on a T&M basis.

**Unit prices will be bid separately from the lump sum bids. National Grid reserves the right, when awarding fixed price pruning projects, to add an estimated price for hazard trees removals based on the prices submitted on this form for removal, and award the total project based on the sum of both prices.**

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### Addendum #2 **National Grid Distribution Forestry Herbicide Application Procedure**

In order to ensure consistent herbicide applications the following procedure and expectations will apply to all tree crews working on distribution line clearance work at National Grid-Rhode Island

The ability to control brush growth on our distribution system is a critical part of achieving our overall line clearance cyclic program objectives. It is important to understand that appropriate

herbicide application will benefit National Grid's service reliability by significantly reducing the amount of re-sprouting that occurs after ground cutting is performed. As professional pesticide applicators, the contractor has an obligation to be educated, prepared and conduct themselves in a professional manner to achieve successful applications on line clearance projects.

- All crews and/or notification personnel will have clean copies of all appropriate notification materials such as labels, MSDS sheets.
- Application logs are to be maintained and available for field review. Copies must accompany the weekly time sheets submitted to the Company. If a customer rejects the use of herbicide it should be noted on the customer log.
- All crews engaging in ground cutting must apply a stump treatment application at the time of cutting. Cutters should carry an applicator bottle on them to ensure a thorough and timely application.
- The primary stump treat product will be Pathway. During periods of frozen ground the vendor shall switch to a Garlon 4/Stalker mix. Finally, the vendor shall also have a glyphosate stump treatment product available on the project for usage in wet areas or other sensitive sites. Equivalent substitutes are acceptable with the approval of the National Grid Forestry Representative.
- Mowed areas are exempt from a stump treatment application; however, these areas will receive an aggressive follow-up foliar application. Stems cut by hand as part of the mowing process shall be stump treated. Cut stubble treatments are also acceptable.
- Herbicide notifications should be incorporated into the general customer notification for pruning and ground cutting. Notification personnel must be knowledgeable of the products being used and present the use of herbicide in a positive, professional and proactive manner. Taking time to fully explain the application technique and product will produce results.
- If a customer refuses an application and there is a significant amount of brush to control you must notify the National Grid Forestry representative prior to proceeding with the work.
- If an inspection or audit occurs you must notify the National Grid Forestry representative immediately.
- Any operations found to be out of compliance will be shut down and payment held until issues are corrected.

Stump treatment is a low profile, customer compatible, target specific technique that ensures effective brush control. A thorough stump treatment also makes the follow-up foliar job easier and more effective.

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